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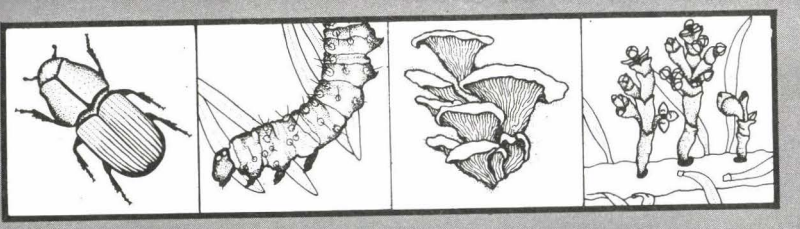

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DOUGLAS-FIR TUSSOCK MOTH ADULT MALE SURVEY NORTH IDAHO AND WESTERN MONTANA, 1981

by

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INTRODUCTION

Populations of the Douglas-fir tussock moth can rapidly increase to epidemic levels and seriously damage infested stands. In order to prevent this damage it is necessary to know in advance when and where outbreaks are going to occur. A survey system using a synthetic sex attractant and sticky traps has been developed to sample the adult male moth population. This sample provides an early warning of impending outbreaks (Daterman et al. 1979). This early warning will provide managers lead time to evaluate management alternatives.

In 1979 the USDA Forest Service, Idaho Department of Lands, and the Montana Department of State Lands implemented this survey system to cooperatively monitor tussock moth populations in northern Idaho and western Montana.

This report summarizes survey results to date.

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METHODS

The Idaho Department of Lands was responsible for surveying in Idaho north of Moscow. The USDA Forest Service was responsible for Idaho surveys from Moscow south to Riggins. The Montana Department of State Lands surveyed western Montana. Survey plots were located in areas with a history of past outbreaks or in areas of known Douglas-fir tussock moth.

Each plot consisted of a meandering line of five traps at least 25 meters apart. Traps were hung on lower branches of host trees at approximately eye level. Traps were placed in the field between August 7 and 20 and retrieved after October 15.

RESULTS

Survey plots were established at 38 locations in 1980; 8 in western Montana, 10 on the Nezperce National Forest, Idaho, and 20 in Idaho from Moscow north. In 1981 monitoring increased to 85 plots; 12 plots in western Montana, 34 in Idaho south of Moscow and north of Riggins (Nezperce and Clearwater National Forests), and 39 plots in Idaho north of Moscow. Due to a shortage of baits and traps, the 19 newly established monitoring sites north of Moscow utilized one trap instead of the standard five.

The synthetic pheromone is calibrated so that average per trap catches of 25 or more tussock moths indicate initiation of an outbreak condition the following year. Moth catches in 1980 were very low, but increased markedly in 1981 (table 1).

Table 1.--Male Douglas-fir tussock moths captured in 1980 and 1981.

Location	Year		
	1980	1981 1/	1981 2/
Western Montana	10	971	327
N. of Moscow, Idaho	0	57	13 3/
S. of Moscow, Idaho	3	63	352
Total	13	1,091	692

1/ Original plots sampled in 1980.

2/ New plots added in 1981.

3/ Plots contained only one trap instead of five.

The only plots with average catches of Douglas-fir tussock moths exceeding 25 per trap were in western Montana where five plots had catches ranging from 26.2 to 77.8 moths per trap. The highest number of Douglas-fir tussock moths caught from areas surveyed in Idaho was an average of 9.6 from two plots on the Pierce Ranger District, Clearwater NF.

To further assess the Douglas-fir tussock moth population, ground examinations of three of the Montana plots that exceeded 25 moths per trap were made during the winter. Two trained observers searched the lower crowns of all tree species in the immediate vicinity of each plot for 15 minutes. No egg masses or cocoons were found.

DISCUSSION AND RECOMMENDATIONS

Douglas-fir tussock moth epidemics occur in north Idaho and western Montana at approximately 10-year intervals. Outbreaks occur suddenly, persist for about 3 or 4 years and then abruptly decline to very low levels. During outbreaks, extensive loss can result to forested areas in the form of tree mortality, top-killed trees, and reduced tree growth. Esthetic quality of an area can suffer and human discomfort can result from the webs, larval hairs, and fecal material associated with epidemics.

Routinely, outbreaks haven't been detected until extensive areas of aerially visible defoliation occur. Planning has then begun for suppression projects. By the time appropriate environmental statements are processed, public information programs conducted, and project plans approved, it is the third year of the outbreak. Suppression projects at this time in the outbreak cycle are of limited benefit because much damage has already occurred and a population collapse is imminent, usually within a year.

The primary benefit of this pheromone survey is to provide an early warning system for tussock moth outbreaks. It is aimed at giving forest managers at least an extra year's lead time to decide for or against direct suppression projects, thus resulting in treatment early enough in the outbreak to prevent much of the potential damage.

Douglas-fir tussock moth population monitoring with pheromone-baited sticky traps is a technique that is being validated for the first time on a rising population, so there is much still being learned about trap catches and subsequent populations. When potential problem areas (those averaging 25 or more moths/trap) are located, a larval survey will be conducted shortly after dispersal in the spring using the system described by Mason (1977). This will provide a measure of the feeding populations and a basis for predicting anticipated defoliation. Cocoon and egg mass surveys during the fall and winter may be helpful in further defining the area of concern.

Pheromone trapping will be intensified in 1982 to better define the area of increasing Douglas-fir tussock moth population. New plots will be established radiating out from those existing plots that had high moth catches in 1981. Stands will be hazard rated for susceptibility to tussock moth (Stoszek et. al 1981) and all areas rated high hazard will be included in the adult monitoring survey.

LITERATURE CITED

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Appendix 1 - 1980 and 1981 Trap Catches

Western Montana

Plot	Location	Average DFTM/trap 1980	1981
Albert Ck.	Sec. 16, 14N, 21W	0	28.4
Big Arm	Sec. 36, 24N, 21W	-	3.0
Butler Ck.	Sec. 24, 16N, 23W	0	26.2
Church Farm (Frenchtown F)	Sec. 10, 14N, 21W	.8	3.0
Corral Ck.	Sec. 36, 15N, 22W	.6	21.2
Frenchtown J	Sec. 22, 14N, 21W	.6	77.8
Frenchtown T	Sec. 23, 14N, 21W	-	52.4
Polson-Lost Lake	Sec. 17, 22N, 19W	-	10.0
Polson-Hellroaring	Sec. 33, 22N, 19W	-	0.0
Rocky Point (Jette Lake)	Sec. 2, 23N, 21W	0	7.6
Rocky Point	Sec. 4, 23N, 20W	0	3.0
Smith Camp	Sec. 8, 25N, 20W	0	27.0

Idaho North of Riggins and South of Moscow

Nezperce NF

Big Tinker Ck.	Sec. 26, 32N, 5E	.4	3.8
Christie Ck.	Sec. 6, 26N, 1E	0	2.8
Cow Creek Saddle	Sec. 36, 26N, 1W	0	.4
Fish Ck.	Sec. 16, 29N, 3E	0	0
Free Use Ridge	Sec. 20, 28N, 3E	0	1.6
Lodge Point	Sec. 13, 32N, 6E	.2	.4
Pine Knob	Sec. 26, 32N, 6E	0	.2
Potato Hill	Sec. 29, 32N, 6E	0	.4
Shells Lick	Sec. 6, 27N, 3E	0	.2
South Fork Cow Ck.	Sec. 17, 25N, 1W	0	2.8

Appendix 1 continued

Craig Mountains

Plot	Location	Average DFTM/trap	
		1980	1981
Black Pine Camp	Sec. 17, 33N, 3W	-	4.2
Cottonwood Butte	Sec. 33, 32N, 1W	-	0
Forest	Sec. 1, 32N, 3W	-	8.6
Junction	Sec. 22, 32N, 4W	-	1.8
Keuterville	Sec. 9, 31N, 1W	-	3.6
Lake Waha	Sec. 15, 33N, 4W	-	0
Webb Cr.	Sec. 17, 33N, 3W	-	.4
	Clearwater NF, Lochsa RD		
Camp Moosehorn	Sec. 4, 34N, 7E	-	3.6
Canyon Junction	Sec. 4, 34N, 7E	-	6.8
Fan Cr. Saddle	Sec. 36, 34N, 6E	-	4.2
Mystery Cr.	Sec. 20, 34N, 7E	-	1.0
Trout Cr.	Sec. 25, 34N, 6E	-	2.6
	Clearwater NF, Pierce RD		
Angel Butte	Sec. 3, 37N, 3D	-	2.2
Bargamin Cr.	Sec. 23, 37N, 4E	-	9.6
Cooper	Sec. 12, 36N, 3E	-	3.0
Deer Cr.	Sec. 6, 36N, 3E	-	2.0
Dent Bridge	Sec. 2, 37N, 2E	-	.4
Fohl	Sec. 8, 36N, 5E	-	2.0

Appendix 1 continued

Clearwater NF, Pierce RD continued

Plot	Location	Average DFTM/trap	
		1980	1981
Grangemont	Sec. 24, 37N, 3E	-	2.0
Huckleberry Mtn.	Sec. 17, 37N, 3E	-	1.4
Johnson	Sec. 9, 37N, 3E	-	9.6
O Mill	Sec. 23, 36N, 4E	-	1.4
Orofino Cemetery	Sec. 7, 36N, 2E	-	0
Wells Bench	Sec. 23, 37N, 2E	-	0
	Idaho North of Moscow		
Bedrock Gulch	Sec. 29, T43N, R3W	0	0
Caribou Creek	Sec. 17, T59N, R2W	0	0
Charles Butte	Sec. 32, T44N, R3W	0	2.0
City of Coeur d'Alene		0	0
City of Moscow		0	0
Coeur d'Alene Mtn.	Sec. 14, T49N, R3W	0	0
East Dennis	Sec. 23, T43N, R3W	0	.2
East Gold Hill	Sec. 13, T42N, R4W	0	.2
Elk Mtn.	Sec. 8, T49N, R2W	0	0
Flat Creek	Sec. 4, T40N, R3W	0	1.2
Lightning Creek	Sec. 36, T59N, R1W	0	0
Lolo Pass	Sec. 33, T45N, R4W	0	.4
Long Creek	Sec. 4,, T40N, R4W	0	1.4
Mineral Mtn.	Sec. 20, T43N, R4W	0	5.0

Appendix 1 continued

Idaho North of Moscow continued

Plot	Location	Average DFTM/trap 1980	1981
Mission Mtn.	Sec. 22, T43N, R5W	0	.6
Paradise Point	Sec. 10, T40N, R5W	0	0
Peterson Point	Sec. 2, T44N, R2W	0	.4
Spring Valley	Sec. 20, T40N, R3W	0	0
Town of Troy		0	0
Vassar Meadows	Sec. 35, T41N, R2W	0	0
	(plots with only one trap)		
Bald Mtn.	Sec. 26, T43N, R2W	-	0
Big Bear Creek	Sec. 17, T40N, R2W	-	0
Big Meadow Creek	Sec. 26, T40N, R4W	-	0
Crane Creek	Sec. 8, T42N, R4W	-	0
East Twin Pt.	Sec. 13, T40N, R5W	-	10
Flannigan Creek	Sec. 26, T41N, R5W	-	0
Hatter Creek	Sec. 22, T41N, R4W	-	0
Head of Sheep Cr.	Sec. 12, T43N, R5W	-	0
Jerome Creek	Sec. 33, T42N, R3W	-	0
Little John Creek	Sec. 20, T44N, R2W	-	0
Lolo Creek	Sec. 28, T45N, R4W	-	2
Mica Mtn.	Sec. 15, T41N, R2W	-	0
North-South Ski Area	Sec. 19, T43N, R2W	-	0
Schwartz Creek	Sec. 32, T41N, R2W	-	0

Appendix 1 continued

Idaho North of Moscow continued

(plots with only one trap) continued

Plot	Location	Average DFTM/trap 1980	1981
Short Creek	Sec. 2, T43N, R2W	-	0
Smith Meadows	Sec. 14, T42N, R3W	-	0
Squaw Creek	Sec. 14, T44N, R4W	-	1
Strychnine Creek	Sec. 31, T42N, R2W	-	0
W. Fk. Mission Ck.	Sec. 33, T43N, R5W	-	0